AN EVALUATION OF WORD FORMATION IN THE TRANSLATION OF ENGLISH MEDICAL TERMS INTO PERSIAN

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AN EVALUATION OF WORD FORMATION IN THE TRANSLATION OF ENGLISH MEDICAL TERMS INTO PERSIAN

by

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To: My dad who took the lead to heaven;

My mom with her great patience;

My lovely son, Aryan; and my sweet daughter, Jasmine.

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b	Borrowing
c	Compounding
C	Sager's Criteria
d	Derivation
e	Eponym
E	Expansion
L	Literal Translation
N	Naturalization
P	PLLA Principles
Pr	Paraphrase
r	Root
S	Shift
SL	Source Language
ST	Source Text
Su	Substitution
T	Through Translation
TF	Term Formation
TL	Target Language
TP	Translation Procedure
TT	Target Text
WFP	Word Formation Process

LIST OF SYMBOLS

Persian Alphabet and International Phonetics

A. Consonants

Persian Alphabet (Arabic letter)	Persian Alphabet (Latin letter)	Phonetic Alphabet (IPA)	Example in Persian	Pronunciation
ا- ع	?	/ʔ/	ʔeltehāb	/ʔelteha:b/
ب	b	/b/	bāzu	/ba:zu/
پ	p	/p/	pā	/pa:/
ت- ط	t	/t/	ʔeltehāb	/ʔelteha:b/
ث- س- ص	s	/s/	dast	/dæst/
ج	j	/dʒ/	jomjome	/dʒomdʒme/
چ	č	/tʃ/	moč	/motʃ/
ح- ه	h	/h/	ʔeltehāb	/ʔelteha:b/
خ	x	/x/	xāji	/xa:dʒI/
د	d	/d/	dard	/dærd/
ذ- ز- ض- ظ	z	/z/	ʔazole	/ʔæzole/
ر	r	/r/	tumur	/tumur/
ژ	ž	/ʒ/	može	/moʒe/
ش	š	/ ʃ /	šāne	/ʃa:ne/
غ- ق	q	/ʁ/	maqz	/mæʁz/
ف	f	/f/	mafsal	/mæfsæl/
ک	k	/k/	šekastan	/ʃekæstæn/
گ	g	/g/	ʔangošt	/ʔængoʃt/
ل	l	/l/	ʔeltehāb	/ʔelteha:b/
م	m	/m/	maqz	/mæʁz/
ن	n	/n/	ʔangošt	/ʔængoʃt/
و	v	/v/	virus	/vIrus/
ی	y	/j/	bāzuyi	/ba:zujI/

B. Vowels

Persian Alphabet (Arabic letter)	Persian Alphabet (Latin letter)	Phonetic Alphabet (IPA)	Example in Persian	Pronunciation
-	a	/æ/	maqz	/mæʁz/
-	e	/e/	šāne	/ʃa:ne/
-	o	/o/	ʔangošt	/ʔængoʃt/
آ- ا	ā	/a:/	bāzuyi	/ba:zujI/
ای - ی	i	/I/	bāzuyi	/ba:zujI/
او - و	u	/u/	bāzuyi	/ba:zujI/

PENILAIAN TERHADAP PEMBENTUKAN KATA DALAM

PENTERJEMAHAN ISTILAH

PERUBATAN BAHASA INGGERIS KEPADA BAHASA PARSI

ABSTRAK

Kajian ini merupakan satu analisis perbandingan ciri-ciri istilah perubatan bahasa Inggeris, menggunakan garis panduan penamaan universal dan prinsip penamaan tempatan dalam bahasa Parsi. Kajian ini bertujuan untuk mengenal pasti persamaan dan perbezaan antara istilah yang sepadan dan tidak sepadan (dalam bahasa Parsi) berdasarkan prosedur terjemahan yang digunakan dalam proses pembentukan kata, serta meneliti keberkesanan penggunaan prosedur terjemahan yang diguna pakai dalam proses penamaan istilah perubatan ini. Kajian ini turut mengemukakan cadangan untuk pembentukan garis panduan penamaan yang khusus untuk penterjemahan istilah perubatan bahasa Inggeris-bahasa Parsi. Analisis statistik yang berbentuk kualitatif deskriptif telah digunakan terhadap data yang terdiri daripada 339 istilah perubatan bahasa Inggeris yang diperoleh daripada teks sumber (ICD-9-CM) dan teks sasaran (Guide to ICD-9-CM) dalam bahasa Parsi. Dua kerangka, iaitu kriteria penamaan oleh Sager dan prinsip penamaan oleh Akademi Bahasa dan Kesusasteraan Parsi telah digunakan untuk mengkaji parameter penamaan kata yang efektif dalam penterjemahan istilah bahasa Inggeris-bahasa Parsi berdasarkan perbandingan morfosemantik istilah-istilah tersebut. Dapatan kajian menunjukkan bahawa 67% daripada istilah ini adalah tidak sepadan dengan garis panduan asas penamaan yang digunakan. Istilah yang sepadan dengan garis panduan pula menunjukkan bahawa prosedur terjemahan yang berkesan telah digunakan dan keperluan penamaan untuk pembentukan kata kedua dalam

penghasilan padanan istilah bahasa Inggeris kepada bahasa Parsi telah dipenuhi. Istilah yang tidak sepadan terhasil daripada pilihan kaedah terjemahan yang tidak tepat. Kajian juga mendapati ketidak sepadanan wujud dalam aspek leksikologi, dan bukannya semantik. Kajian turut mendapati bahawa terjemahan terus dan naturalisasi ialah prosedur yang berkesan untuk menterjemah istilah perubatan bahasa Inggeris kepada bahasa Parsi sekiranya prosedur ini digunakan secara bersendirian, dan tidak digabungkan dengan prosedur lain. Masalah ketidak sepadanan istilah pula adalah disebabkan oleh prosedur peminjaman dan penggantian.

AN EVALUATION OF WORD FORMATION

IN THE TRANSLATION OF ENGLISH MEDICAL TERMS INTO PERSIAN

ABSTRACT

This study provides a comparative analysis of the characteristics of Persian medical terms, using the universal naming guidelines and local naming principles in Persian. The aim of the study is to determine the similarities and differences of the compatible and incompatible terms (Persian equivalents) with respect to the applied translation procedures and the employed word formation processes. The study also sets out to investigate the effectiveness of the adopted translation procedures in the naming of the medical terms and to propose the specific naming guidelines in the translation of English-Persian medical terms. The descriptive statistics and qualitative analysis were employed to analyse the collected data which consisted of a population of 339 English medical terms from the source text (ICD-9-CM) and their pair language from the target text (Guide to ICD-9-CM) in Persian. The research was based on two theoretical frameworks, namely Sager's naming criteria and word designation principles by the Persian Language and Literature Academy (PLLA) to investigate the effective word formation parameters for the translation of English medical terms into Persian through morphosemantic comparison of the terms. The finding indicated that 67% of the terms were incompatible with the basal naming guidelines employed in the study. The compatible equivalents indicated that the effective translation procedures had been used and the naming requirements for the secondary word formation of the equivalents in the translation of English medical terms into Persian had been fulfilled; while the incompatible ones illustrated the usage of the wrong methods. The findings also indicated that the incompatibility of

the equivalents appeared in the area of lexicology rather than semantics; and through translation and naturalization appeared as two effective procedures if they were applied independently and not in combination with any other procedures. In contrast, the incompatibilities occurred due to borrowing and substitution procedures.

CHAPTER ONE

INTRODUCTION

1.0 Introduction

> Language phenomena tend to evolve very slowly. At first glance, language seems static and unchanged day after day. Generally speaking, the linguistic situation of a country appears completely steady, forever fixed as a snapshot. On the one hand, this impression is partially due to the fact that the process of change is very slow; and, on the other, to the fact that it is quite difficult to see what is happening because we lack the parameters that would be useful in measuring the differences between two analyses. Nor is there any measure of language development, in so far as the intensity and the direction of development are concerned. History shows us, however, that language, like all other living organisms, is constantly changing in a never-ending effort to adapt to the continuously evolving reality that it must convey (Corbeil, 1980, cited in Cabre, 1999, p. 214).

Today, as science and technology continue to develop as a rapid pace, language plays an increasingly important role in keeping up with these changes. Beheshti (1999: 27) posits that scientific terms are developing rigorously alongside the growth of various humanities fields. She believes it is crucial that new scientific terms be standardized immediately in order to make it easier for authors and translators to use. She also emphasizes that there is great difficulty in naming millions of ever-increasing concepts. Sager (1990:14) defines concept as an element of the structure of knowledge that plays an important function in the philosophy of science and in theories of cognition. He believes that terminology is concerned with concepts and knowledge structures only to the extent to which they are represented in the lexicon of a language.

Cabre (1999: 11) claims that there are two major user groups dealing with terms for two specific purposes: first, for direct communication and second, for communication through intermediaries or for communication which is mediated in

some other ways. Terminology includes two closely related aspects based on the needs of such groups: communicative and linguistic. For the first group, terminology plays the role of a tool for communication, while for the second, it is considered as the target of the work. Terminology intermediaries are the professionals who deal with language such as translators, technical writers and interpreters for whom terminology, such as glossaries and specialized dictionaries, is required to assist them in technical writing or in translating a text from one language to another.

As the needs for translation of scientific subjects increase, problems pertaining to translation also arise. Lexicons and dictionaries from various cultures cannot cope with quantitative and qualitative difficulties that surface with the development of science and technology (Beheshti, 1999: 27). A translator is able to translate scientifically or systematically when accurate dictionaries contain universal definitions applicable in all fields. However, when dictionaries are not accurate, the translator is in jeopardy of delaying the publication and the document risks losing its accuracy in terms of information as new knowledge continues to be discovered while the slow translation process takes place.

Beheshti (1999: 27) believes that there are two major problems when exchanging scientific information globally: firstly, there are different scientific levels across the countries; secondly, there is a lack of standardized (fixed) language components and elements for the scientific word formation (WF). This is significantly apparent, particularly when the exchange of scientific and technological information takes place across the developed, industrial and developing countries. Although most engineers and other professionals have strong understanding of their scientific language, they still encounter problems and difficulties, particularly in

executing projects and attaining broad access to new information. Once new concepts in scientific and technological development are imported into a country, new terms have to be created in order to guarantee accurate and careful completion of the scientific project (Beheshti, 1999: 27). A logical solution for the ever-increasing insufficiency of the lexicon is to find a mechanism for WF and/or naming, so that the language can continue to have new words (Haq Shenas, 1999: 487). Thus, the need for coining scientific terms proves to remain paramount (Zarnikhi, 2003: 51). Auger (1986) explains:

> It is well-known that people do not read dictionaries and, consequently, distributing lexicons is not sufficient to initiate a change in the language attitudes of users. We should accept the fact that these terminological products are not always designed for or addressed to well–defined target users. Conversely, they are too frequently conceived without taking into account users' needs (cited in Cabre, 1999, p. 19).

This dilemma raises many questions, creates ambiguity for the general public, and even perplexes specialists. According to Bahadori (1999: 363), most common questions include:

1. Why is there a need to develop new Persian words, especially for scientific fields and for medicine in particular?

2. Would it not be better to spend time acquiring knowledge and learning about science itself rather than trying to find modes of effective translation?

3. If a medical text can be read in its original language, would the reading be more comprehensible?

4. Does the time spent on translating text delay the scientific progress?

Bahadori (1999: 363) answers to the above questions in the following way:

- A culture and language indicate its own uniqueness in scientific fields. When scientific information is written in foreign languages, the knowledge is based on the context of those languages or cultures.

- Persian speakers speak, write and think in Persian on a quotidian basis; therefore, they should not be forced to engage in a foreign language beyond their linguistic and cultural familiarity. Sager (1990: 87) supports such a belief and states that “On the whole, linguistic communities which import scientific and technological knowledge tend to prefer the use of their own linguistic resources for the creation of terminology”.

Bahadori (1999: 363) argues that if previous Iranian authors of medical books, such as Avicenna and Razi, had already written their works in Persian, they could have written a medical and scientific thesaurus in Persian, as Sa’adi and Hafez did in their Persian poetry and prose. Science does not belong to a certain country or community. Today, Chinese and Japanese people tend to write articles in their own languages and other nations have to translate them into their languages. When the literature is in demand, its contents are translated into their languages so that they can be made available to a wider group of readers.

Terms and special languages are not limited to a certain group in a society and this highlights the necessity for the translation of scientific and technical texts not only for communication purposes but for the exchange of scientific and technical information. According to Sager and Johnson (1980: 81-104), special languages are limited to communication between specialists. Special languages, or more precisely special subject languages, are usually thought of as the means of expression of highly qualified subject specialists like engineers, physicians, lawyers, etc. and are often

referred to as “jargon”. Believing Sager’s restriction to be irrelevant, Picht and Drasku (1985), on the other hand, argue whether it is true to say that “the use of LSP presupposes special education and is restricted to communication among specialists in the same or closely related fields (Sager, Dungworth and McDonald, 1980: 69).” Communication between experts with high application, initiation, instruction, training and development with lower applications are the purposes for which LSP may be used (Picht & Drasku, 1985: 3). Felber (1984) believes the crucial role of terminology in communication as follows:

> Progress in science, technology and economy is heavily dependent on communication of information. This communication of information, however, is strongly impeded by difficulties which arise because of ambiguous terminology. Unambiguous communication is only possible if the concepts – the elements of thinking – have the same meaning for all who participate in the communication process at the national or international level (1984, p. 44).

This study intends to provide new findings based on adopted guidelines to Persian scientific development planners, particularly in the usage of the Persian language in scientific fields. According to Zarnikhi (2003: 48), terminology is part of a scientific language and it is considered an instrument for scientific development. The results of the study can be made accessible to other researchers or authors to effectively deliver their scientific analyses and suggestions, thus extending knowledge forward.

1.1 The Persian Language

According to Baqeri (2005: 12), linguistically, the Persian language belongs to the Indo-European family of languages, known as the Indo-Iranian or Indo-Aryan. It is the most widely spoken of the Iranian languages today. The dialect spoken in Tehran is the most common dialect of Persian (NMELRC, *c.* 2006: 3). Historically, it

is divided into three distinct stages: Old, Middle and New (N. Khanlari, 1995: 158). The new stage is subcategorized into two phases: classical and modern – although both variants are mutually intelligible.

The Old Persian language belongs to the original Parsa tribe of the Achaemenid era, who carved many texts on stone in cuneiform script. The middle Persian language was used during the Sassanid or Pahlavi era, during which most of the works were in the form of religious writings of the Zarathushti religion. The origin of Classical Persian is rather obscure. In short, the words from different languages spoken in various parts of the country are mostly rooted in Old Persian, Pahlavi and Avesta. The Modern Persian language or Farsi (Arabic pronunciation of Parsi) is made up of many words which are not of Iranian origin. Farsi has integrated English, French and German into some of its technical terms, but on the whole has been influenced by Arabic which has replaced many original Persian words.

1.1.1 Emergence of Arabic in Persian

According to NMELRC (*c.* 2006: 2), Arabic has caused the most significant changes to the Persian language following the conquest of Persia by Islam in the year 650. The Arabs spread their language and religion throughout Persia (previous name of Iran). As a result, the vocabulary and grammatical elements of the Persian language were affected by Arabic. N. Khanlari (1995: 202) states that consequently, the Persian language and culture deteriorated for several hundred years, during which Arabic was the language of study for both religious and secular purposes. The Persian language survived just as a spoken language and even so was greatly influenced by Arabic. The original Persian writing system was forgotten and a number of Persian poets and intellectuals began to use the Arabic writing system for

writing in Persian in the tenth century. Poets like Hafez, Sa'di, and Ferdowsi wrote a large portion of the classical Persian poetry and attempted to maintain the Persian language together with certain cultural aspects of pre-Islamic Persian folklore included in order to limit the deluge of Arabic loanwords into Persian.

The damage to the Persian language, because of the distortion by Arabic words, drove original Persian words out of the language, resulting in the reintroduction of original Persian words sounding alien to many readers (Rahnamoon, *c.* 2007). The latter editions of 'Khordeh Avesta', the prayer book of the Zarathushties, which one would expect to be in the Avesta language, did not escape such damage (N. Khanlari, 1995: 242).

1.1.2 The Persian Language and Influence of Arabic

According to N. Khanlari (1995), the Iranian science was also disrupted by the Arab invasion (630 A.D.). Many schools, universities and libraries were destroyed, books were burned and scholars were killed. Due to the extent of cultural calamity, the Khwarezmians, after one generation, became illiterate. Nevertheless, the Iranian scientists carried on and the science of Iran (Persia) resurfaced during the Islamic period. In an effort to save their books from the Arabs' carnage, many Pahlavi writings were translated into the Arabic, and Iran produced physicians and scientists the likes of Avicenna and Rhasis and mathematicians such as Al Kharazmi and Khayyam.

According to Yarmohammadi (1993: 256), national identity is preferably a socio-political discussion, rather than merely a linguistic one, which needs to be processed in a different study. It is true that native speakers should preserve their mother language; however, such preservation refers to working with the language to

facilitate relations between the speakers so that their expressions are mutually intelligible. On that note, Persian would be considered as one of the significant factors leading to national unity for Iranians.

According to Masumi (2003: 270), no attempt has been made to convert Persian into a scientific language throughout the Islamic era, because: firstly, the Persian written works were less frequent than the works written in Arabic. It is sufficient to enable the Arabic and Persian works' frequencies written by Abu Rayhan Biruni and Avicenna to be compared with each other. Persian written scientific works were nevertheless significant, especially in the Islamic genesis era, namely the third and fourth centuries AH, in which most scientists had to migrate to the science center, Bagdad, and consequently were forced to write their works in Arabic. This situation remained even after the first Iranian government. There had been a shift from Arabic to a common scientific language during this period, while Iranian scientists were able to continue their scientific studies at home.

The second reason is the fact that the scientific works written in Persian are not limited to a certain group but are available to the public. They have been written in the form of simple texts that are understandable for people who neither know Arabic nor are they scientists. If we accept that a scientific language genesis is due to science production through a special language, science production in the Persian language has not been significant. In fact, Persian scientific works are mostly translation of works originally written in Arabic, as the authors of most of these works have highlighted it out in the introductions of their works.

The final and most important reason is the fact that in the sixth and seventh centuries AH, science in Iran was limited to well-established and stable institutions,

such as schools. However, this phenomenon occured alongside another revolution in which the applied teaching language in schools was Arabic. Hence, the scientific works eventually became written exclusively in Arabic, and Persian gradually lost its utility for scientific works.

Furthermore, there has been no known attempt to name terms or form Persian equivalents even in works written in Persian since the Ilkhanid era onwards. In fact, one language has always been predominant as the scientific language over the ancient and medieval periods. Examples of this were Greek for ancient time, Latin for Christian medieval period and Arabic for Islamic states.

During this period, the scientists who wrote their works even in Persian referred to Arabic if there is a need for any new concept. The most straight forward method that they adopted was the formation of an Arabic word/term through derivational or combinational potentialities, while the Persian language system appeared to be actively used in the composition of poetry. Hence, combinational potentiality in Persian language, ignored in recent scientific works, has remained well-guarded for native speakers through literary works, as one of the sources available and applicable for WF in Persian.

According to Sadeqi (2003: 499), the Persian language (Dari dialect) was the language of public speech in Tehran and the great cities of Iran (Khorasan state) during the Sassanid era. Scientific, religious, philosophical and colloquial languages as well as administrative correspondence were carried out in Pahlavi or Middle Persian. Those who wrote their works in one of these languages or translated the works written in Greek or other languages into one of these languages applied WF based on morphological principles in this language. Following the collapse of the

Sassanid era, Arab's sovereignty over Iran and the act of making Arabic the official language of Iran led them to translate the texts from Pahlavi into Arabic. Following the writing of scientific books in Arabic, some of the terms in Pahlavi were translated into Arabic from the first to the third centuries. However, most of the new terms were directly created according to Arabic WF patterns. The Iranians started to write in their own language again in the fourth century. Scientists, who could write their works in Persian, were fluent in Arabic, too. Therefore, some of them such as Avicenna and Biruni wrote most of their works in Arabic and provided Persian speakers with just some abstracts and translations of some of their works. Due to its convenience, they preferred to borrow the terms from Arabic instead of processing the words in Persian. Hence, WF through Persian elements and Persian grammar was affected by Arabic words; and some specific WF principles were forgotten alongside the Pahlavi language.

Following the entrance of the western world culture and new sciences into Iran, the necessity of new-word formation was intensly felt. During what is estimated to be the early fourteenth century AH, word formation found another direction in which new words were formed from Persian elements and they were based on the WF principles in Persian. The ever-increasing need to create new words converted the semi-generative and even dead principles into generative ones in Persian. For example, affixes limited to a few words may be attached to a new root and generative principles will be exploited completely. The word "kade" (house, home, place) in contemporary Persian appears in some compound words such as "ātaškade" (fireplace), "meykade" (bar), "dehkade" (village) and "botkade" (idol temple), but it has been employed in some other in recent decades, such as "dāneškade" (school in

university), “pajuheškade” (research center), “honarkade” (conservatory), “zabānkade” (language center).

1.1.3 Pahlavi Dynasty

Attempting to rid Iran of Arabic influence in the twentieth century, the kings of the Pahlavi dynasty (1925-79) launched a campaign to replace Arabic loanwords with older Persian ones or new Persian words derived from native roots (N. Khanlari, 1995). According to the Permanent Committee on Geographical Names (PCGN) (2003), it became inevitable that the Arabic language would be employed as the principal means of administration in Persia as Arab governors were appointed to rule over Persian states while Pahlavi continued in the spoken form. In addition, several linguistic variants in Pahlavi have been revealed with limited effectiveness, especially when their use is discerned by social class and not by geographical location. PCGN (2003) claims that the constitution identified the Persian language as the official language of the country; and in the 1930s an attempt was made to purify the Persian language of Arab vocabularies. In 1935, the Shah changed the country’s name from ‘Persia’ to ‘Iran’, the name it was allegedly borne at the time of the original Aryan settlement. NMELRC (*c.* 2006) states that the Iranian identity remains both Persian and Islamic by nature. It is also interesting to note that just because Persian is profoundly influenced by Arabic does not necessarily mean that Persian speakers know Arabic.

1.2 History of Medical Translation

Fischbach (1986: 16) believes that medical and religious translations are the most global and ancient fields of scientific translations, since the human body is homogeneously ubiquitous. According to Pilegaard (1997), translating many Greek

writings into English started from the fifteenth century onwards, but English appeared as the international language of medicine only some 500 years ago. Besides, English medical translators of the fifteenth and sixteenth centuries fundamentally faced both the challenges of translating from classical languages or contemporary native languages into English, and the following employment of loan words or exotic terms from non-classical languages. Medical science development was somehow slow at that time. Translation in this field was simple since the basic anatomical and physiological elements of medical communication were largely the same all over the world. The equality of the concepts of various fields led the medical translators to complete translations without difficulties compared to their colleagues from other fields (Fishbach, 1986: 19), suggesting that medical translation was a comparatively easy task. As a result, "English has today replaced Latin as the language of international medical communication" (Pilegaard, 1997: 161).

1.3 Medical Terminology

A medical terminology is a set of terms that standardize the recording of clinical findings, interventions, circumstances and events to support clinical care, decision making, research, quality improvement and other healthcare related activities (Kin, 2009: 1). The basic function of medical terminologies is to enlist all the terms that will be used in a certain domain. Many terminologies go beyond this to provide some forms of organization, definitions and relationships between the terms. A considerable number of medical words were created alongside developing technology as medical science which is progressing every day. This is also true for new areas in medical science involving special words and terms. One can argue that because of this when first confronted with the medical terms, an average person is often bewildered by the strange spelling and pronunciation.

According to Mareckova et al. (2002: 581), the history of medical terminology indicates that France, Italy and England started to use Latin for discussing medical terms, with France being the first. They explain that although Latin was previously used as a teaching and scientific language, its nominating purpose and basic role as the key component of the language of medicine terminology has been preserved and retained. International Latin-Greek terms have so far played professional communicative roles in the national languages, although Latin is not as applicable to the medical terminology in the twentieth century. Apart from this, Latin and Greek were considered unique resources which may also be useful for creating new terms. In this regard, Mareckova et al. (2002) claim that:

> Furthermore, it should be noted that in the last century there appeared a new phenomenon which was menacing the special terminological function of Latin in modern medicine – the English language. There exist contradictory views of its status and perspectives. These range from H. Lippert's (1987: 86-101) assertion according to which English has taken over the role of Latin in medicine, to the opinion of the well-known German historian of medicine H. Schipperges (1988: 59, 63, 153), who states that Latin with Greek "have masterfully outlived" not only the Arab influence in the Middle Ages, but also the fierce onset of English in the 20th century. English medical terminology is predominantly Latin or Latinate (2002, p. 582).

Following the discussion of many standard medical terminologies as well as well-accepted morpho-syntactic structures in a medical text, Shan (2005: 22-30) labels it as 'standardized text'. A successful communication can be achieved when the translator standardizes those subject-specific words or terms. However, for the language units other than subject-specific ones, the translator should respect the intricacies of each language. It should be noted that while "an important point of scientific translation is that, of all the components of the language, technical terminology has the highest probability of one-to-one equivalence" (Wilss, 2001: 131), finding equivalence at the word level in medical translation must be exercised

cautiously especially in the case of cultural concepts or where the source language (SL) is not lexicalized in the target language (TL).

It is also true that people in different parts of the world use different images in describing the same sense or meaning that they share, which is not seldom seen in the medical context. Shan explains that for example, the translator should seek out the equivalent Chinese language for medical words like “pigeon chest” as “鸡胸” [*ji xiong*] (Chicken chest) rather than“鸽胸” [*ge xiong*] (Pigeon chest)，“goose gait” as “鸭步” [*ya bu*] (duck gait) instead of “鹅步” [*e bu*] (goose gait)，because they fit into the Chinese people's thinking and imaging patterns.

Kussmaul (1997: 67) believes that ‘convention’ means compliance and anticipation, when people are expected to use the words in the same sense as others who use them. Shan (2005: 22-30) clarifies this with an example of a late phrase in surgery, “minimally invasive surgery”. He suggests that this phrase already has a unified Chinese equivalent as “微创手术” [*wei chuang shou shu*] (very minute concentrate surgery). As the author found while editing medical abstracts, such translation as “minor-injury surgery”，or “no-wound surgery,” he claims that Chinese translators who are not familiar with the English version of this phrase may propose various kinds of similar interpretations. According to Shan (2005), these interpretations may not be regarded as wrong because “minimally invasive surgery” has replaceable linguistic features and the most important aspect is that “minimally invasive surgery” as a whole expresses a fixed notion in surgery and serves as a symbol for it, which means “surgery done with only a small incision or no incision at all, such as through a cannula (套管) [*tao guan*] with a laparoscope (腹腔镜) [*fu giang jing*] or endoscope (内窥镜) [*nei kui jing*]”. This English version has become

well accepted in the international medical field; therefore, it is conventional and standardized.

Shan (2005) insists on cautious translation when it comes to finding the equivalents at the word level when there is no equivalent in the TL or with culturally specific concepts. When the translator tries to achieve a successful communication, then this area of translation is significant. For example, an SL word which is a noun might be translated into a noun phrase in the TL, like English into Persian. It is due to the lack of the relevant SL grammatical structure in the TL (the Persian language) compared to the SL (the English language). For example, the word ‘condense’:

condense	*taqliz kardan (* تغلیظ کردن*)*
English	Persian

‘Condense,' which is a single word in English, has been transformed into a phrase in Persian, during the translation process of borrowing from Arabic. The problem of translating derivations of such words in the Persian language will be solved through finding appropriate Persian equivalents for them (Kafi, 1984).

Regarding to “Condensed, condenser, condensing, condensation” and “to condensate” which are other derivations of “condense”, Kafi (1984) adds that if we find a Persian equivalent (like *čegālidan (*چگالیدن*)*) for this English word which is a common term in Physics, then every derivation could be translated easily. Newmark (1988: 85) mentions that comparative linguistics’ research and analysis of text corpuses with respect to translation studies may further uncover a significant number of serviceable shifts for us.

Persian has been able to satisfy all the communication needs of native speakers during its past history and provided them with required scientific and literary

concepts, according to Sheqaqi (2003: 505). However, it seems unable to continue to do this today, especially in scientific fields, as it has relied on Arabic for 1400 years and satisfied all its needs through borrowing from Arabic. On the other hand, since most scientific and theoretical concepts alongside industrial and nonindustrial goods are imported to Iran from the west at present, word-borrowing flow has been substituted from Arabic to European languages.

1.4 Statement of the Problem

Catford (1965: 20) defines translation as “the replacement of textual material in one language (SL) by equivalent textual material in another language (TL)”. According to Catford's principles, the main difficulty in translation practice is finding translation equivalents in the TL. It indicates the significance of “equivalent and how to find it” during the translation processes. According to Catford, equivalent as a method of finding equivalences is a procedure that includes all components in the translation process. If there is a guideline for finding or coining an equivalent for a word or term, the translator can effectively practice his/her work. Without a standard pattern of WF, the suggested equivalent would not be concise.

The problem arises as new ideas and new methods in sciences emerged rapidly. Finch (1969: 5) states that the text in the SL may conform to the existing terms, invent new terms, or use metaphors. The translator may then be required to build terminology in his own language; however, he may experience difficulties. Newmark (1981: 20) discusses the problems using the electric field as a point of reference. He believes that a text should be treated like a particle in an electric field—drawn by the contradictory impacts of the cultures and norms of the SL and the TL, the characteristics of one writer (who may breach the norms of his own language), and

different characteristics of its readers, the preconceptions of the translator or possibly its publisher. Furthermore, the text is influenced by the possible deficiency of the translator who might be lacking in accuracy, resourcefulness, flexibility, elegance and sensitivity in the application of own language. As a result, his work may suffer from two other areas: “knowledge of the texts subject matter, and knowledge of the SL”. In the translation process, the translator must not only have knowledge of the SL but also must be knowledgeable in the related scientific text, so he will be able to find the exact concepts for the new words or terms and use them as appropriate and accurate equivalents. However, any translator may face such difficulties in translation of any subject, language, word or term. Thus, the equivalents will not be only one word, but would be in many words according to the inclination or personal taste of the translators.

Subject matter, user, and situation of communication are three variables in the subsets of language, according to Cabre (1999: 65), who characterized them with the term “special languages”. It is therefore assumed that a special language is not a monolithic subset in structure, but indicates the following variations based on usage and the communicative situation:

a. The degree of abstraction which depends on the subject matter, the recipients of the information, and the sender’s communicative purpose.
b. The communicative purpose which determines variations in text type.
c. Geographic, historic, and social dialects.
d. Personal style.

Special languages are subsets of the language as a whole, not only sharing features with the general purpose language, but also maintaining firm exchange of units and conventions.

Yazdi and Bedayat (2003: 230) refer to publicity and specialty, as important subjects, in addition to the accuracy of created words, which must be utilized not only in medicine but also in all fields. According to them, current Persian culture unfortunately honors the use of foreign words by native speakers. For example, women like to use the word "peeling" instead of "removing skin layer" or youths wish to use the word "orthodontics", instead of the "dandān ārāyi" (دندان آرایی) phrase, because they believe these variations are more prestigious. The terms "peeling" and "orthodontics" are technical terms in medical science, but are accepted in general language, as the public uses them easily in their general communication. Medical doctors and other healthcare providers also refuse to apply the equivalents for several reasons. One of the most important reasons mentioned earlier is lack of accuracy in word designation. Yazdi & Bedayat (2003: 230-1) believe that medical student who does not understand a particular equivalent will study the original concept in order to understand it. The Persian equivalent of a common concept does not carry perfect accuracy of the word. For example, "thoracotomy" is a term which is too specific for a medical student to have a Persian equivalent with any sufficient accuracy. Persian speakers do not have the accurate and concise resources in the Persian language to find the equivalents for medical terms since they have not created such technology (Yazdi and Bedayat, 2003: 230-1). Thus, what would be the solution for such problem? Should we permit the use of foreign words into the Persian language just because native Persian speakers couldn't find the equivalent? This study aims to answer these questions by establishing the effective guidelines in finding acceptable

equivalences in Persian. A great volume of imported words motivates the scientists and concerned speakers of Persian to try to seek a solution for it. We cannot directly transfer all English concepts to a native Persian speaker, but we can achieve this by transferring them into the Persian language patterns earlier, so they may be accepted by Persian speakers / communities (Asadi, 1990: 5). According to Ashuri (1995: 44-46), native elements and word formation processes (WFPs) or Persian principles / patterns can be a base for finding equivalents for imported words.

Following a study on the status of Persian scientific language in the era of old and modern sciences since the middle of the fourth century AH, Sadeqi (1993: 125-6) concludes that the Persian language were incompatible with foreign languages during two periods of time. Because of the urgent need for education and high speed development of science, there has not been the opportunity to redevelop. Additionally, Persians have not been able to create a basic scientific language because of lack of consensus among linguists. Sadeqi (1993: 125-6) argues that the problems in scientific and technical language are the result of borrowing foreign language structures and grammar, lacking fixed or standardized scientific terminology or disagreement among authors and translators.

Therefore, the Persian language should adopt the following methods to address imported foreign words or terms:

1. Employing borrowing as a translation procedure (TP) without any attempt to find any equivalent in Persian,
2. Finding equivalent by WF or using forgotten or archaic words through survey in history, culture and any other aspects of language in the Persian language.

In the first method, many problems will appear in medical translation when the Persian translator tries to borrow words from other languages or employ non-Persian or imported words in medical texts (Bahadori: 1999: 367), indicating a lack of equivalents for some terms in the Persian language.

The Persian language faces the following problems:

1. Different pronunciations in the phonetics of terms, e.g. the word "manipulation" which is pronounced as [manipolāsiyon] /manIpola:sIjon/ by many and [manipoleyšen] /manIpolejʃen/ by others.
2. The employment of different words from several languages for one foreign term, which provides different phonetics and different meanings.
3. Variation of medical terms based on the individual preferences of authors and translators in the TL i.e. lack of standardization.

Thus, if there is an effective guideline for naming words, particularly for scientific words, translators will not decide on seeking equivalents based on individual preferences. With effective guidelines for naming words, there would be more unity and less incompatibility in establishing terminology equivalents. Borrowing much equivalence from several languages for only one foreign word would obviously indicate that none of the equivalences found has been universally adopted.

In the second method, other problems arise when a person tries to translate imported words into the Persian language (Bahadori, 1999: 367). The available terminology will not be employed by translators and authors, since:

a. Terminology is archaic in regular discourse, such as “shār” for “flow”, or “komizdān” for “bladder”.

It has been demonstrated that translators use words which are not common or popular in regular discourse. Thus, it is not acceptable to the public or specialists to use such words. The problem is that authors and translators use equivalences based on personal preferences.

b. They are the words of different origin, such as “ehteqān” for “congestion” and “solbiye” for “sclera”.

Although naturalization is one of the TPs (Newmark, 1981), based on borrowing as one of the WF principles (Katamba, 1994), it can also be employed as a naming method. This will also be the solution for finding an equivalent. While the word under the translation process is a foreign word, native speakers prefer to borrow the word directly from the SL instead of referring to another language. Generally, such discordance is due to the lack of an effective guideline for naming the words.

c. Several equivalences are employed for one term, e.g. (حبابچه) [hobābče] /hoba:btʃe/ or (حباب) [hobāb] / hoba:b/ or (خانه های ششی) [xāneha:ye šošī] /xa:neha:je ʃoʃI/ for “alveolus”.

Lack of effective or concise guidelines for word naming or designation during the translation process may lead to several equivalents, created by different authors and translators, for one particular word. This study assits Persian language users to promote effective guidelines in order to prevent multiple equivalents for one word or term.

d. It is the obligation of the translator and author to find adequate equivalents for any foreign term they encounter in medical texts. The translator is responsible to transfer the message correctly and accurately.

In some certain areas and subject fields, e.g. in Botany or Chemistry, term creation happens based on some specific plan and leads to higher theoretical speculation (Sager, 1990: 61). Sager (1990) believes that:

> Unlike words whose origin is rarely traceable, the terms are the result of more or less conscious creation. If we can discover a greater number of regularities in the naming patterns of textually related lexical items, it is assumed that we shall be able to:
>
> a. Construe the rules of naming applicable to a subject field,
> b. Establish rules for future rule-governed designation,
> c. Possibly even relate the motivation of naming patterns to the more elusive motivation of concept creation.
>
> Furthermore, if it can be shown that naming patterns, as reflected in complex terms, by means of such devices as determination, derivation, etc., are developed on the basis of the systematic selection of certain properties and characteristics for overt inclusion in the form of a term, then we may actually have gain some insight into the mental processes involved in concept formation and association. Any attempt to discover regularities in term formation, however, is fully aware of the limited usefulness of this enterprise and of the circumstances in which term formation occurs (1990, p. 61).

Lack of appropriate equivalences for terms or technical words is the result of ineffective translation guidelines adopted in the translation process. A research needs to be done to solve the problem. The increasing number of foreign words and specific terms incorporated into the native language are the result of the ongoing development of technology and science. This highlights the magnitude of the problems and therefore, this study aims to address these problems. The study also, finally will target to propose the effective guidelines in the naming and WF during translation processes.

1.5 Objectives of the Study

The main objective of the study is to develop a standardized mechanism in translating English medical terms into Persian. The specific objectives will be executed through the following processes:

1. To study the naming characteristics of English–Persian medical terms in two existing guidelines.
2. To investigate the applied translation procedures and their effectiveness in the naming of the terms.
3. To study the morphosemantic factors in the naming processes.
4. To propose the specific naming guidelines in the translation of English-Persian medical terms.

1.6 Research Questions

1. What are the naming characteristics of the English-Persian medical terms based on Sager's criteria and the Persian Language and Literature Academy principles?
2. What are the translation procedures adopted in question one and how effective are those procedures in naming the word?
3. How do the morphosemantic factors contribute to the naming process in both guidelines?
4. What is the particular naming guideline/parameter to be proposed for the translation of English-Persian medical terms?

1.7 Significance of the Study

Developments in medicine, science and technology are mounting alongside the growth of medical terminology, and The World Health Organization (WHO) has

estimated that several thousand new terms are being created annually (Barkman, 1974: 28).

Recent observations indicate the need for scientific research to combine morphemes, especially medical ones to produce new WF in the Persian language. In order to maximize the potentialities within the complex Persian technical language, a text must be converted into a generative language, a language which is comprehensible and accessible to professionals (Mansouri, 1999: 224-5). According to Mansouri combining morphemes is significant in European medical WF and naming, so foreign dictionaries, especially medical ones, present combined morphemes as entries. He highlights it as medical terms in such languages are ever-increasing, developing neck and neck with broad developments in medicine. Most of the new terms can be formed mainly through the same combining components and settled WF patterns. This means that medical language in European languages is generative for its professionals. He argues that the generative nature of medical language in Europe is not applicable to Persian readers or translators, so not only does the Persian language indicate null function in medicine but also something lower than base, as medical language in Persian has not shown any progress.

Mansouri (1999: 224-226) explains that given those entries introducing a foreign combining morpheme (suffix or prefix), most of Persian medical dictionaries usually provide the reader with its information just by presenting the Latin combining component and providing its meaning through translation of its definition. He believes that it can never be helpful to the translator, unless he is fluent in medical terminology. The translator should analyze the term into its combining components when referring to a dictionary, and should guess the meaning of the whole word